

REMARKS

Claims 1, 2, 4-14 and 16-25 are pending in the present application. In the Final Office Action mailed May 16, 2008, the Examiner rejected claims 1, 2, 4-6, 9, 10, and 20-25 under 35 U.S.C. §103(a) as being unpatentable over Ookawa (US Pub. 2001/0004211) in view of Laub (USP 6,380,740), and further in view of Jeppard, Peter “Physical Basis of Spatial Distortions in Magnetic Resonance Images.” in: Bankman, Isaac N., Handbook of Medical Imaging Processing and Analysis (San Diego, Academic Press, 2000), pp. 425-435 (hereinafter Jeppard). The Examiner next rejected claims 7 and 8 under 35 U.S.C. §103(a) as being unpatentable over Ookawa in view of Laub, further in view of Jeppard, and further in view of Stephen J. Riederer, “Current Technical Development in Magnetic Resonance Imaging,” IEEE Engineering in Medicine and Biology Magazine, September/October 2000 (hereinafter Riederer). Claims 11-14, 16, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. (USP 5,873,825) in view Ookawa, and further in view of Jeppard. Claim 17 was rejected under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view of Ookawa, further in view of Jeppard, and further in view of Riederer. Claim 19 was rejected under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view Ookawa, further in view of Jeppard, and further in view of Laub.

Claim Rejections under 35 U.S.C. §103(a)**Claim 1**

Considering claims 1, 2, 4-6, 9, 10, and 20-25, the Examiner rejected the claims under 35 U.S.C. §103(a) as being unpatentable over Ookawa in view of Laub, further in view of Jeppard. In rejecting independent claim 1, the Examiner stated that Ookawa in view of Laub teaches every limitation except for the that of “playing out a dummy acquisition following each of the magnetic preparation pulses.” *See Final Office Action*, May 16, 2008, p. 6. To teach this, the Examiner relied upon Jeppard and stated that Jeppard “teaches the application of a delay which is determined by applying dummy acquisitions or scans in order to allow spins to have reached a steady state when the image signal is detected and to curtail non-frequency-encoded (e.g. phase – and/or slice encode) derived artifact or noise.” *Id.*

First, while the Examiner contended that Jeppard is in the same field of endeavor as both Ookawa and Laub, Jeppard simply addresses spatial distortions in conventional magnetic resonance imaging. *Id.* Again, Jeppard does not disclose the use of magnetic preparation pulses, and Jeppard also fails to teach the elliptical centric phase ordered acquisition of Applicant’s invention. As such, it clearly would not have been obvious to one of ordinary skill in the art to

have incorporated the generalized dummy scan acquisitions of Jezzard with the alleged elliptical centric phase ordered acquisition of Ookawa in view of Laub, as Jezzard is drawn to a completely different type of MR data acquisition.

Even if these were analogous references, while Jezzard does use the terminology “dummy scan” acquisitions, Jezzard does not call for “playing out a dummy acquisition following each of the magnetic preparation pulses”, as is called for in claim 1. In fact, Jezzard merely states that “[a] well-designed pulse sequence will incorporate enough ‘dummy scan’ acquisitions that when the image signal is detected, the spins have reached a steady state.” *Jezzard*, Section 6.2, p. 434. This is not nearly enough to teach one skilled in the art how to practice what is currently claimed. For example, nowhere does Jezzard state or imply that these “dummy scan” acquisitions need to be played out following each magnetic preparation pulse, as is specifically called for in claim 1. In fact, Jezzard does not even disclose the use of magnetic preparation pulses in conjunction with dummy acquisitions, let alone the use of dummy acquisitions following each magnetic preparation pulse. Jezzard merely teaches incorporating “enough” dummy scan acquisitions into the pulse sequence, without ever defining the frequency or pattern of the dummy scan acquisitions so as to provide a benchmark for what is considered “enough”. *Id.* As Applicant’s Specification discloses, playing out dummy acquisitions following each magnetic saturation pulse “may greatly improve image quality with the reduction of ghosting artifacts typically associated with steady state effects.” *See Specification*, Para. [0030]. Jezzard fails to even teach the use of magnetic saturation pulses, and thus Jezzard cannot possibly teach “playing out a dummy acquisition following each of the magnetic preparation pulses,” as is called for in claim 1. As such, the Jezzard reference, in combination with Ookawa in view of Laub, cannot be shown to teach or reasonably suggest each and every limitation of claim 1.

Thus, in view of the arguments set forth above, Applicant believes that the combination of Ookawa in view of Laub further in view of Jezzard fails to teach or reasonably suggest all that is called for in independent claim 1. As such, Applicant respectfully requests that the rejection to claim 1 be withdrawn, along with withdrawal of the rejections to all claims dependent therefrom.

Claim 11

Claims 11-14, 16, and 18 were rejected under 35 U.S.C. §103(a) as being unpatentable over Mistretta et al. in view Ookawa, and further in view of Jezzard. In regard to claim 11, the Examiner alleged that Mistretta et al. in view of Ookawa teaches every limitation of the claim except for the step that the computer is programmed to “play out a dummy acquisition following each of the magnetic preparation pulses.” *See Claim 11*. Once again, though, the Examiner cited

the Jezzard reference to teach playing out a dummy acquisition following each of the magnetic preparation pulses. See *Office Action*, supra at 19. However, as was set forth above with respect to claim 1, the Jezzard reference does not sufficiently teach or suggest the missing limitations of claim 11. Specifically, the Jezzard reference merely discloses that “[a] well-designed pulse sequence will incorporate enough ‘dummy scan’ acquisitions that when the image signal is detected, the spins have reached a steady state.” *Jezzard*, Section 6.2, p. 434. Nowhere does Jezzard state that these “dummy scan” acquisitions are played out following each magnetic preparation pulse, as is specifically called for in claim 11. In fact, Jezzard does not even disclose the use of magnetic preparation pulses in conjunction with dummy acquisitions, let alone the use of dummy acquisitions following each magnetic preparation pulse. Jezzard merely teaches incorporating “enough” dummy scan acquisitions into the pulse sequence, without ever defining the frequency or pattern of the dummy scan acquisitions. *Id.* Clearly, the Jezzard reference cannot be shown to teach or reasonably suggest those elements lacking in the Mistretta et al. reference and the Ookawa reference. At best, Jezzard discloses the general concept of “dummy” acquisitions, but nowhere does Jezzard teach or suggest that the dummy acquisitions are played out following each magnetic preparation pulse. Accordingly, Applicant respectfully requests that the rejection to claim 11 be withdrawn, along with the withdrawal of the rejections to all claims dependent therefrom.

Claim 20

Considering independent claim 20, the Examiner stated that “Ookawa in view of Laub does disclose: A computer readable storage medium having stored thereon a set of instructions that when executed by a computer causes the computer to: - play out at least one dummy acquisition during MR data acquisition following each of the magnetic preparation pulses.” *Office Action*, supra at 12. However, the Examiner provides no support for how Ookawa in view of Laub teaches this limitation, which is in fact inconsistent with the rejection to claim 1. With respect to claim 1, the Examiner stated that “Ookawa in view of Laub does not disclose ‘and playing out a dummy acquisition following each of the magnetic preparation pulses.’” *Id.* at 6. Clearly the Examiner rejections of claims 1 and 20 are contradictory. As such, Applicant believes that the rejection to claim 20 should be withdrawn, as the Examiner has not fully and clearly articulated how Ookawa in view of Laub teaches or reasonably suggest all limitations set forth in claim 20.

Further, as it appears that the Examiner has mistakenly omitted the Jezzard reference from the rejection of claim 20, Applicant notes that the Jezzard reference also fails to teach the

missing limitations of claim 20. As was similarly set forth above with respect to claims 1 and 11, the Jezzard reference merely discloses that “[a] well-designed pulse sequence will incorporate enough ‘dummy scan’ acquisitions that when the image signal is detected, the spins have reached a steady state.” *Jezzard*, Section 6.2, p. 434. Again, nowhere does Jezzard state that these “dummy scan” acquisitions are played out following each magnetic preparation pulse, as is specifically called for in claim 20. In fact, Jezzard does not even disclose the use of magnetic preparation pulses in conjunction with dummy acquisitions. Jezzard only teaches incorporating “enough” dummy scan acquisitions into the pulse sequence, without ever defining the frequency or pattern of the dummy scan acquisitions. As Jezzard clearly fails to teach the limitations missing from the combination of Ookawa and Laub, Applicant believes that the rejection to claim 20 is not proper under 35 U.S.C. §103(a). Accordingly, Applicant respectfully requests that the rejection to claim 20 be withdrawn, along with the withdrawal of the rejections to all claims dependent therefrom.

Therefore, in light of at least the foregoing, Applicant respectfully believes that the present application is in condition for allowance. As a result, Applicant respectfully requests timely issuance of a Notice of Allowance for claims 1, 2, 4-14 and 16-25.

Applicant appreciates the Examiner’s consideration of these Amendments and Remarks and cordially invites the Examiner to call the undersigned, should the Examiner consider any matters unresolved.

Respectfully submitted,

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General Authorization and Extension of Time

The Commissioner is hereby authorized to charge any additional fees which may be required regarding this application under 37 C.F.R. §§ 1.16-1.17, or credit any overpayment, to Deposit Account No. 07-0845. Should no proper payment be enclosed herewith, as by credit card authorization being in the wrong amount, unsigned, post-dated, otherwise improper or informal or even entirely missing, the Commissioner is authorized to charge the unpaid amount to Deposit Account No. 07-0845. If any extensions of time are needed for timely acceptance of papers submitted herewith, Applicant hereby petitions for such extensions under 37 C.F.R. §1.136 and authorizes payment of any such extensions fees to Deposit Account No. 07-0845. Please consider this a general authorization to charge any fee that is due in this case, if not otherwise timely paid, to Deposit Account No. 07-0845.

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